**Cost Volume Profit Analysis (CVP) and The Break Even Point Analysis**

CVP involves examining the relationship between prices, volume and the costs involved with earning a net income.

CVP analysis:

* is a key part of many decisions a manager will make.
* studies the relationship of prices of products, volume of sales or production, the per unit variable costs, the total fixed costs and the mix of products sold
* can answer questions such as:
  + Do you know what your most profitable products or services are?
  + What sales volume is needed to earn a target income?
  + Do you know what will happen if your sales volume drops?
  + How far can it drop before you start losing money?
  + If you lower your prices in order to sell more, how much more will you have to sell?
  + How much will income increase if we install new equipment to reduce labor cost
* in its basic form, CVP is often called break-even analysis
* requires management to classify all costs as either fixed or variable with respect to a chosen activity base
* activity base - a measure of what drives or causes the cost to occur
* can be input driven: direct labour hours, machine hours or output driven: production, sales volume

**The Break Even Analysis:**

Break-even analysis is a special case of CVP. The Break Even Point is the volume point at which revenues and costs (expenses) are equal; a combination of sales and costs that will yield a no profit/no loss operation.

Before exploring the break-even point, you must be able to calculate the Contribution Margin per Unit. This is the amount of a product's unit selling price exceeds its total unit variable cost to calculate this you use the following formula

Contribution Margin per Unit = Selling Price (per unit) – Variable Cost (per unit)

**Example:**

Company XYZ sells widgets for $100 per unit and incurs $70 of variable costs per unit sold. What is the Contribution Margin per Unit?

Contribution Margin Per Unit = Selling Price (per unit) – Variable Cost (per unit)

100-70 = 30

Contribution Margin Per Unit = 30

**Completing the Break Even Analysis:**

Formula:

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| Example (continue the previous example):  Company XYZ sells widgets for $100 per unit and incurs $70 of variable costs per unit sold. XYZ's fixed costs are $24,000 per month and the monthly capacity is 1,800 units (widgets).  Contribution Margin per Unit is $30 ($100 – $70)    Company XYZ breaks even for the month when it sells 800 widgets.  At a price of $100 per unit, monthly sales of 800 units generate revenues of $80,000 (break-even sales dollars)  **Break Even Sales Dollars: Other Methods to Complete a Break Even Analysis**  Formulas:  Contribution Margin per Unit = Sales Price per Unit – Variable Costs per Unit  Contribution Margin Ratio = Contribution Margin per Unit divided by Sales Price per Unit  Break-Even Sales Volume = Fixed Costs divided by Contribution Margin Ratio   |  | | --- | | **Example:**  Assume that the financial statements for Lillian's Bakery reveal that the bakery's fixed costs are $49,000, and its variable costs per unit of production (loaf of raisin coffee cake) are $0.30.  Further assume that its sales revenue is $1.00 per loaf. From this information, it can be determined that, after the $0.30 per loaf variable costs are covered, each loaf sold can contribute $0.70 toward covering fixed costs.  What information is known?  Sales Price per Unit = $1.00  Fixed Costs = $49,000  Variable Costs per Unit = $0.30  Calculate Break-Even Sales Volume using the above formulas.  Abbreviations used: CM – Contribution Margin. To verify that Lillian's Bakery's breadk-even point equals $70,000 (or 70,000 units), we prepare a simple income statement. |  |  |  | | --- | --- | | Contribution Margin per Unit | = Sales Price per Unit – Variable Costs per Unit | |  | = $1.00 – $0.30 = 0.70 | |  |  | | Contribution Margin Ratio | = CM per Unit divided by Sales Price per Unit | |  | = $0.70 / $1.00  = 0.70 | |  |  | | Break-Even Sales Volume | = Fixed Costs divided by CM Ratio | |  | = $49,000 / 0.70  = $70,000 | |

**TRY IT ON YOUR OWN:**

Your company sells bikes

Sales Price = $500 per bike

Variable Cost = $300 per bike

Fixed costs $80,000

Calculte the following:

Contribution Margin Per Unit:

Contribution Margin Ration;

Break Even Sales Volume:

Complete the Income Statement to Verify:

How will managers use this tool?

* to select product lines with the highest contribution margin ratio to recover fixed costs and to generate maximum profit
* to achieve a target net income, to determine how much product or service, knowing the CM ratio, are needed to meet a projected income
* to see the effects of changing fixed costs
* to see the effects of changing variable costs
* to see the effects of changing selling prices
* to see the effects of changing management strategies.